

AMENDMENTS TO THE SPECIFICATIONIn the Specification:

Please re-write the paragraph (added by the previous Preliminary Amendment) that immediately follows the Title, as follows:

The ~~present~~ subject patent application is a Continuation of U.S. Patent Application Serial No. 09/322,183 (Attorney Docket No. P6997), filed May 28, 1999, entitled "A Method Of Distributed Resource Management Of I/O Devices In A Network Cluster," now U.S. Patent No. 6,732,166.

Please re-write the paragraph that runs from page 3, line 16 to page 4, line 2, as follows:

Referring to the figures in which like numerals indicate like elements, Fig. 1 is a block diagram illustrating an example network according to an embodiment of the present invention. A network is shown and may be a storage area network (SAN) or other network. SAN 100 includes several hosts (or host servers) and input/output (I/O) resources (such as I/O units or I/O devices) which are interconnected via the SAN fabric 102. SAN fabric 102 may be a collection of switches that are interconnected via communication links. SAN 100 also includes a SAN fabric services 202 which may be located on any host or on a dedicated network management host. SAN fabric services 202 ~~provide~~ provides some control and management functions for the SAN 100.

Please re-write the paragraph that spans page 6, lines 14-19, as follows:

As shown in the example system of Fig. 2, the I/O unit 112 includes a unit management service (UMS) 230 for managing and controlling I/O unit 112. I/O unit 112 further includes I/O controllers (IOCs) 114A and 114B. I/O controller 114A is connected to I/O devices 116A,

including devices 116A(1), 116A(2) and 116A(3). Similarly, I/O controller 114B is connected to I/O devices 116B, including devices 116B(1), 116B(2) and 116B(3). UMS 230 and the I/O controllers 114A and 114B are connected to the SAN fabric 102 via a network interface controller (NIC) 232.

Please re-write the paragraph that runs from page 7, line 18 to page 8, line 2, as follows:

The other hosts in cluster 104 may include a similar structure to as host 108. In particular, the OS of each host includes an RMA 214 and a CRT 216. For example, host 110 includes a copy of the I/O device allocation application 210B within its user space 206B, an OS file system and device drivers 212B, an RMA 214B, a CRT 216B, a NIC driver 218B and a NIC 220B within kernel space 208B.

Please re-write the paragraph that runs from page 9, line 16 to page 10, line 2, as follows:

As noted above, each I/O controller within an I/O unit can be addressed using a MAC address of the NIC on the I/O unit and an I/O controller number. Each I/O device attached to the I/O controller can then be accessed or addressed using the MAC address of the NIC, the I/O controller number and the I/O device number that identifies the specific I/O device attached to the I/O controller. Each I/O unit or host can include more than one NIC. For the sake of brevity and simplicity, each host and I/O unit in the examples described herein include ~~includes~~ only one NIC. Thus, when a host or I/O unit only has one NIC, the MAC address of the host is the MAC address of the host's NIC, and the MAC address of the I/O unit is the MAC address of the I/O unit.

Please re-write the paragraph that spans page 13, lines 1-6, as follows:

Figs. 3 and 4 merely provide examples of the network information stored in ~~en~~ the database 204 and the CRT stored in a host. The network information in database 204 and the CRT can include less or more information, and may be provided in different formats. For example, additional fields can be provided to describe the model or size of an I/O device, vendor ID, features or attributes of a host or I/O device, a mode of operation (e.g., 32-bit mode or 64-bit mode), or other information, etc.

Please re-write the paragraph that spans page 16, lines 3-8, as follows:

At block 520, the RMA 214A updates its local CRT (which may have been replaced in block 515) based on the actual I/O unit and I/O device configuration of the SAN. While the host 108 was down or disconnected from the SAN, one or more I/O units, I/O controllers or I/O devices may have been added to or removed from the cluster, and are not reflected in the most recent CRT obtained by the RMA in step 515. Thus, the RMA 214A contacts each of the I/O resources ~~resource~~ to directly obtain this actual I/O resource configuration/topology information.

Please amend the paragraph that runs from page 19, line 15 to page 20, line 5, as follows:

Moreover, the present invention advantageously provides a single interconnect or network (e.g., SAN fabric 102) for both (1) I/O transactions, such as I/O data packets sent between hosts and their I/O devices for read and write operations, and (2) the connections for allocating resources and obtaining updated I/O resource information (e.g., RMA-to-RMA connections, RMA-to-fabric services connections, management connections and service connections). The present invention allows multiple clusters to coexist on a single interconnect or network because I/O devices and hosts can be allocated among different clusters. The I/O device allocation application can be run from any host in the cluster to allocate any I/O device to

any host(s) in the cluster. Hosts can automatically obtain updated I/O resource information from other hosts and I/O resources in the cluster and can discover new I/O devices that have been added or removed from the cluster. The host then updates its CRT accordingly and can inform other hosts in the cluster of the CRT changes (e.g., changes to the I/O resource allocation or configuration in the cluster).

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